

SCOTLAND'S STORY

39

**The charge into
a new era of
industrial power**

**Tobacco Lords
rule the waves**

**Women and kids
are shock troops
of the revolution**

**Dirty talk down
in the sex club**

**Full speed ahead
for industry by
snail pace canal**



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1760

Women (and children) employed on a large scale as colliers and coal hewers.



Orkney

1769

The wasteful Newcomen engine is superseded by James Watt's new technology.



1770

Glasgow's elite Tobacco Lords enjoy extravagant and wealthy lifestyles.

1771

Glasgow is a leader in the tobacco trade, importing over 48 million lbs from America.



1775

Matthew Boulton begins partnership with James Watt.



1785-6

New Lanark established in beautiful Lowland valley.



1778

David Dale establishes his first Scottish cotton mill at Rothesay on Bute.



1798

Boulton and Watt's company manufactures steam engine 'kits'.



1800

Robert Owen becomes manager of New Lanark.

**In Part 40:
Revolution
and radicalism**

PART OF
IRELAND

North
Channel

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ENGLAND



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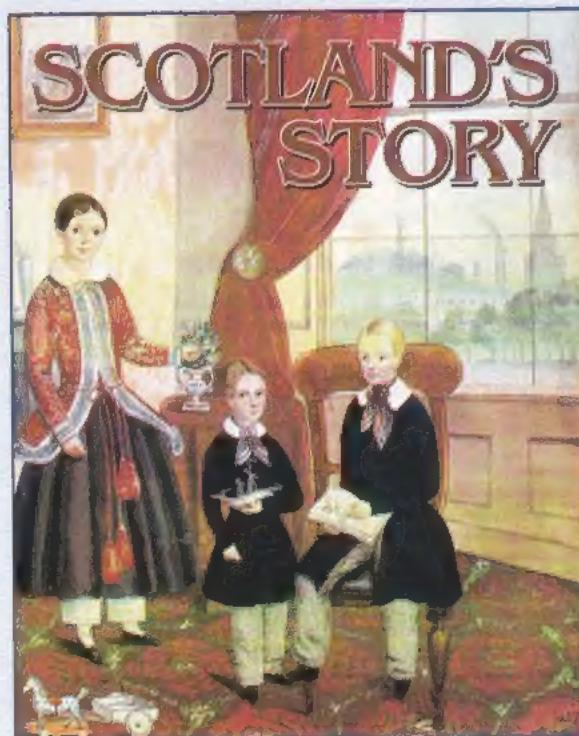
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COVER: Glasgow's Mahoney family, who found wealth and fortune after Mr Mahoney became a tycoon of the tobacco trade.

The birth of industry

Between 1760 and 1830 Scotland's landscape, society and economy underwent a rapid and radical process of alteration as the industrial revolution got underway. Scotland was unique in Europe for the speed and depth of its change during this period.

Several factors played their part in the developments that occurred. Access to new colonial markets and the establishment of a more stable economy in the years after 1750 helped create the right circumstances.

Thanks to a burgeoning colonial tobacco trade, Glasgow became the foremost tobacco centre in the United Kingdom and one of the most important port cities in western Europe. At least 48 million pounds in weight of American tobacco was imported by the Glaswegian merchants in 1771, at the expense of trading rivals in English towns such as London and Liverpool.

Heavy industry such as the Carron Iron Works and the Prestonpans vitriol factory owed a debt to ideas and methods imported from other countries, especially England.

In turn, Scotland gave its industrial peers new advances of its own such as Watt's steam

technology. While there was a rapid influx into the new urban centres of the industrial Lowlands, Scotland's was still very much a rural economy and society during this period.

In the rural areas, commercialisation and industry was speeded along by the landed elite, who invested large sums of money in farming enclosures, farmhouses, roads and bridges.

Meanwhile, the heavy industries owed much to the new commercial interests of the old landowners such in coal, ironstone and lead mining, banking interests, commercial partnerships and landholding in the colonies.

The onset of capitalism opened the floodgates to 'new wealth' – merchants who profited hugely from new commercial opportunities.

Foremost were the Glasgow 'Tobacco Lords', many of whom invested in landed estates, adopting the trappings of wealth that had hitherto been the preserve of the nobility.

For all its technological and commercial advances, Scotland's early industrial revolution was dependent on human labour – mostly carried on the backs of ordinary men, women and children.

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Cotton and iron lead the charge into era of industry

It was tough on workers, satanic mills were real, yet out of the rush for profit there was also remarkable inventiveness and the emergence of people with humane principles

Linen was the product which had brought Scotland's economy into the modern era. Coal had begun to play its part in substituting for wood and peat. But cotton and coke-smelted iron were to hurl Scotland into the industrial age.

Although Scotland's Industrial Revolution was a more concentrated process than in England, it had not arrived out of the blue. Manufacturing (particularly of yarn and cloth) and extractive industries, like lead-mining and lime-quarrying, had become increasingly important in the first half of the 18th century.

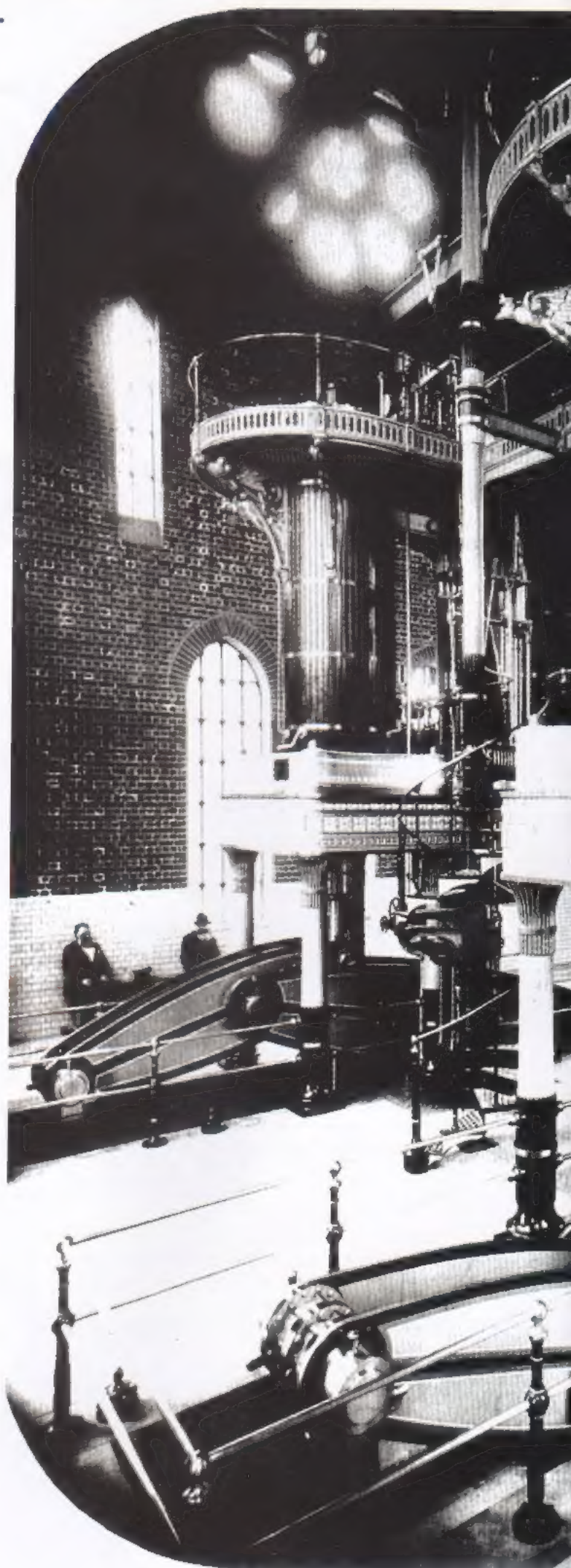
Most of the textile work had been carried out in the home, organised on the putting-out system. However, the archetypal workplaces we associate with the Industrial Revolution – the mill, factory and the mine – where workers were employed and supervised under one roof, had their precursors in the

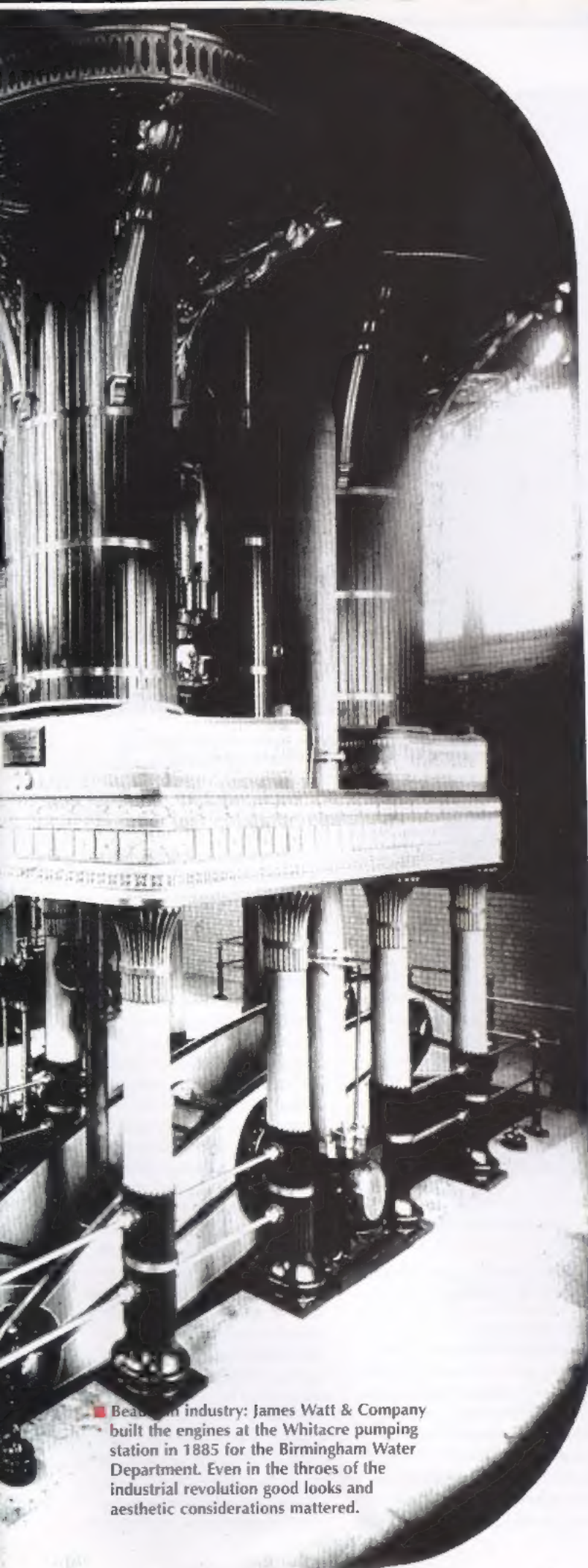
extensive bleachfields, lint mills and some large collieries of the pre-industrial era.

Much of the necessary capital had been generated earlier, too, through the strengthening banking system. Business skills had also been built up, and connections established with buyers in England and overseas.

In Glasgow and the west of Scotland it was not uncommon for the colonial merchants – the tobacco lords – to invest in coal-bearing estates and industries such as leather, sugar refining, linen and iron. It is also significant that the first moves from linen to cotton were made by men who had formerly been linen merchants.

The prime example was David Dale (1739-1806), who had worked first as a handloom weaver in Paisley, became a yarn merchant and then transferred his interests to cotton. He was eventually involved with at least five of Scotland's most





■ Beam steam industry: James Watt & Company built the engines at the Whitacre pumping station in 1885 for the Birmingham Water Department. Even in the throes of the industrial revolution good looks and aesthetic considerations mattered.



■ The Birmingham industrialist Matthew Boulton (above) was James Watt's business partner to build steam engines at competitive prices.

important cotton works, including New Lanark.

Landowners, too, had become alert to the economic benefits which could accrue from encouraging industrialists to locate on their estates.

The first cotton mills in Scotland were set going in 1778 in Penicuik, Midlothian, and at Rothesay on the island of Bute. Others followed quickly in the following decade, and sprang up in large numbers in Lanarkshire and Renfrewshire.

Mills were also built in Perthshire, with one at Stanley, near Perth, on the river Tay. During further expansion in the 1790s, one was even opened – with Dale as a partner – on the Dornoch Firth, at Spinningdale. By the later 1830s, there were more than 190 cotton mills in Scotland, employing around 100,000 people.

If all textile employment is included, however, the total rises to over quarter of a million by the early 1800s. Indeed, cotton, linen, woollens and silk accounted for almost 90 per cent of all recorded employment in Scotland at this time.

The main factor determining the mills' location – cotton but also linen and wool – was adequate running water. This explains why so many cotton mills were built in the

vicinities of Glasgow and Paisley (in the river Cart basin), although existing business links in Glasgow, and easy access to cotton imported up the river Clyde, were also attractions. Higher up the river, near the Falls of Clyde, the massive New Lanark cotton works was established by 1786, again with David Dale very much to the fore.

It was only in 1799 that New Lanark was sold for £60,000 to the businessman and social idealist, Robert Owen, Dale's son-in-law. After around 1800 steam was used to power spinning mills, most of which were now built in Glasgow and Paisley. Water power continued to be important, however, more so than in England.

The impetus behind the establishment of cotton spinning in Scotland was the rising price of linen yarn. Often overlooked, however, is another factor; the early cotton masters hoped that by pirating English cotton spinning technology and exploiting Scotland's lower labour costs, they could undercut English cotton manufacturers.

All of the early spinning technology, including James Hargreaves' hand-powered spinning 'jenny' and William Crompton's mule, was brought north from England. The anticipation ►



■ Water was the main industrial source of power before steam and even after Newcomen's steam-driven engine (above) made an appearance in the coalfields in 1715. Watt revolutionised industry in the late 18th century, yet Newcomen's less-efficient engine still remained popular.

► of doing well in Scotland also enticed Richard Arkwright, England's leading cotton spinner and the inventor of the water-powered spinning frame. His aim was to use Scotland as a razor 'to shave Manchester'.

It was Arkwright who provided the plans and technology for the first mills, including those at New Lanark, Stanley, Catrine (Ayrshire) and Woodside (Aberdeen). He also sent workers from Scotland down to his base at Cromford, to acquire the necessary spinning skills.

Similar hopes lay behind the establishment of the Carron Iron Works, near Falkirk, in 1759. The first partnership comprised Samuel Garbett and John Roebuck – Englishmen who had joined forces in Birmingham – and William Cadeil, a Scottish merchant with local knowledge of coal and iron reserves and potential sites for the works.

Carron was modelled on the leading English iron firm at Coalbrookdale. Virtually every building was erected under the guidance of or by English workers, many of whom were persuaded to come to Scotland by the promise of higher wages.

This, however, was a temporary arrangement. As soon as possible they were to be replaced by cheaper Scots who, it was reckoned, were



■ Smethwick's 38ft-high engine (above) enabled Watt to carry out tests which went on to establish a standard layout of pumping engines.

only worth four shillings (40 pence) a week. Scots labourers who 'may become Coaliers' were sought to fill the places of coal miners from Shropshire for instance, while in the works generally, the partners agreed 'to keep in view the introducing of apprentices' when their existing employees demanded higher wages.

Housing was provided only where

absolutely necessary.

The relative backwardness and lack of requisite skills amongst Scots workers was a major hurdle for the early industrialists. Virtually every industry was affected. It was true even in pottery, in which efforts were being made to compete with Staffordshire ware.

One of the partners of Prestonpans

Pottery in 1786 was advised that his enamelling man 'would do as well with a mop'.

New working habits, too, had to be inculcated. A regular working week was virtually unknown in Scotland outside the skilled urban trades. Many of the first centralised works were located in the countryside or in small planned villages, and drew on rural labour.

Men and women from this background were used to an irregular pattern of work which would be broken by periods of unemployment or illness, or child-birth, as well as by periodic drunken and rumbustious holidays, during religious fairs and those held on market days.

An investigation into Carron's financial difficulties in 1769 concluded the main cause was that the works had been founded in a 'Country of Idleness'. Drinking and the theft of materials from the workplace were endemic, and considered by workers to be their customary rights. Eliminating such obstacles and creating in the workplace a regime of 'order and economy' was no mean feat, and continued to plague employers well into the first half of the 19th century.

Easily overlooked is the simple fact that a trained and trustworthy



■ David Dale, started off as a handloom weaver in Paisley, but later became involved in five of Scotland's most important cotton works.

class of managers and supervisors had not yet emerged.

It was men of this rank who would have day-to-day responsibility for managing the new centralised workplaces, and attempt to drive a wedge between workers and their familiar world of custom. But they were rarely to be had.

Robert Beatson, trying anxiously in the 1760s to introduce more efficient working in the Fife colliery for which he was responsible, wanted to dismiss the current griever or oversman. But, he lamented: "Tis next to a miracle to get one to that office that is honest."

What was more, as colliers were in the habit of stealing coal from the 'hill' during the summer months, he needed both night and day grievers, to keep watch.

The struggles for control and to cut costs were not confined to the mine, mill or factory. Similar forces were at work in the countryside. In 1767, Sir Gilbert Elliot was advised by his estate factor that to 'make the greatest improvement at the Smallest Expense is the great Secret of Farming'.

Early industrialisation was an uneven process. Alongside the new armies of machine-minders there was an expansion in the numbers of hand workers, who continued to

labour in their homes or small workshops. They, too, had to learn new disciplines. Handloom weavers, the most numerous of the so-called domestic workers, had to be persuaded not to cheat their merchant-employers by handing over short and sub-standard webs.

The weavers' practice of taking an extended weekend, which lasted until Tuesday, was also notoriously difficult to stamp out. The trade was becoming overcrowded, however, with women, children, Highlanders and the Irish joining the ranks of the handloom weavers as lengthy apprenticeships were abandoned and the work lost its skilled status.

As a result, the weavers' earnings fell from the end of the 18th century and it became increasingly difficult to convince them that they should work for little when they could play for nothing.

In town and country, within or outside the mill, work became more regimented. For some it was a miserable transition. The handloom weaver William Thom, for example, was employed for several years after 1814 in a weaving factory in Aberdeen. In his autobiographical 'Rhymes and Recollections of a Hand-Loom Weaver' (1844), he has left a chilling testimony to the drudgery and demoralisation of

ENTREPRENEUR WHO VALUED SOCIAL REFORM ABOVE PROFIT

Robert Owen made his name as a wealthy cotton spinner, who devoted his time to social and economic ideas designed to correct 'the disadvantages of progress'.

One of the most successful business figures of his time, Owen made his fortune and his reputation at New Lanark – the cotton spinning community on the River Clyde.

Born in 1771 at Newton, Montgomeryshire, and leaving home when he was in his early teens, Owen rose from draper's apprenticeships in Stamford, London and Manchester, to machinery manufacturer.

By the mid 1790s he was a leading cotton spinner and mill manager in Manchester, the 'Cottonopolis' of the early industrial revolution.

He made money, but also educated himself and turned his mind to social reform.

Business brought him to Glasgow, where he married Ann Caroline Dale, daughter of David Dale, a businessman and banker, who in 1785 – initially in partnership with Sir Richard Arkwright – had built New Lanark.

Owen persuaded his partners to buy the mills and, by 1800, installed himself as manager.

His first few years were devoted to getting rid of Dale's appointees, cleaning up the streets and houses, making the mills more productive and spelling out a set of regulations for the factory village.

He opened a store, got in cheap supplies, and invested the profits in the school, welfare and medical provision.

He stopped employing the pauper apprentices Dale had picked up from the Edinburgh and Glasgow parishes and ruled that no child under 10 should be employed. By 1812

he had turned his attention to education, inviting Joseph Lancaster, a pioneer of new teaching methods, to Glasgow.

Owen claimed to have made sweeping reforms at New Lanark and after 1813, when his public career began, it attracted considerable publicity.

He described progress in 'A New View of Society' (1813-16), which attempted to relate character formation to environment.

In the uncertain times following the Napoleonic War, Owen's claim to produce both conforming characters and high profits at New Lanark could hardly fail to appeal.

In 1817 he developed the 'Village Plan' which foresaw a network of small communities devoted to farming or industry, rather like New Lanark, but where the profit motive would be secondary to co-operation and education.

Unfortunately he failed to get either government or private backing, partly because of his increasingly public views against religious sectarianism, law and marriage.

Even more controversial were his views on birth control and how he saw population being regulated in the communities.

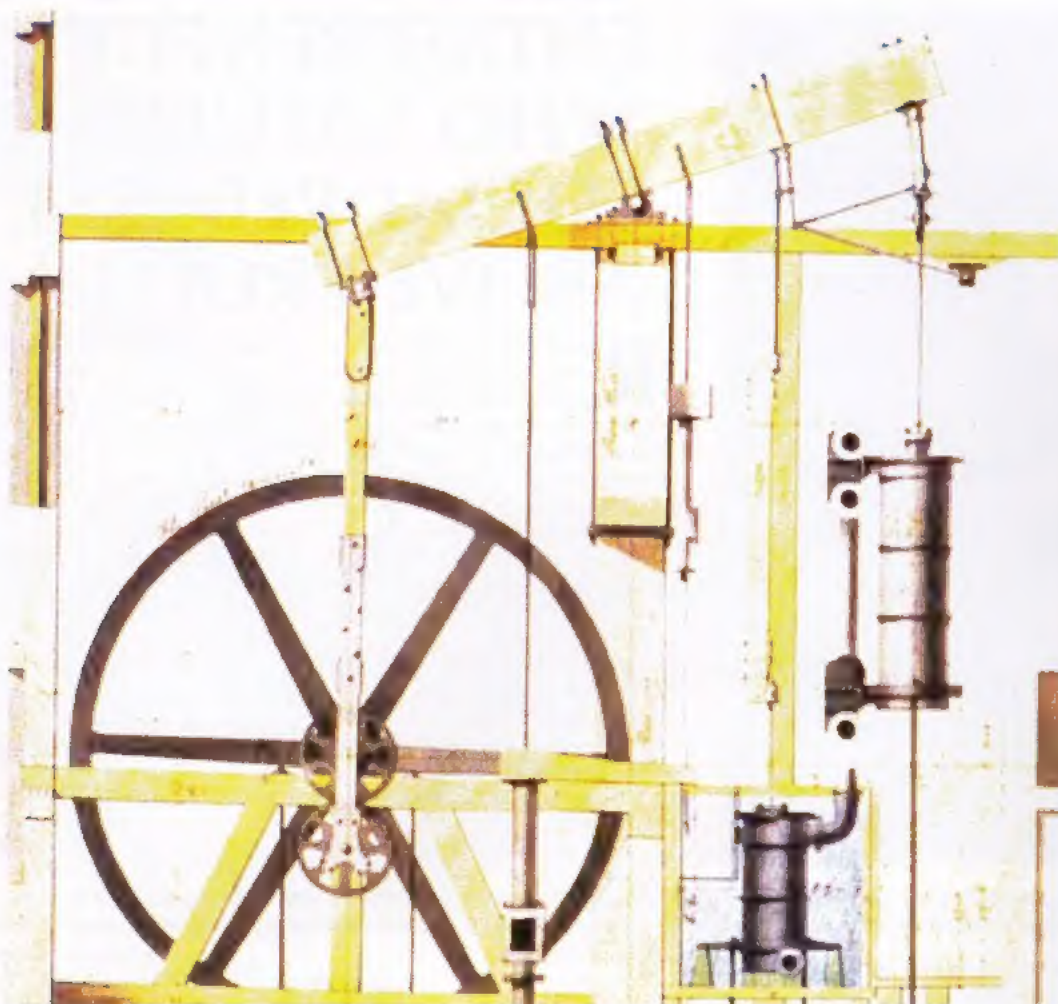
However, he proved more successful in his efforts to turn New Lanark into a showpiece visited by reformers from all over the world and gaining government support for Factory and Poor Law reform.

Owen left for the United States in 1824 to establish a 'Community of Equality' at New Harmony in Indiana.

This was short-lived, but on his return to Britain, in 1829, he played an important role in trade unionism and consumer co-operation.



■ Robert Owen proved profit and compassion could go hand-in-hand.



■ Boulton & Watt's steam-driven pumping engine was the most efficient for use in water-filled mine tunnels. It came as a 'kit' with a plan (above, dated 1798) and a workman, known as an erector, put the parts together.

► factory work, the weavers' spirits being sustained only by song and 'the dew drops that gathered during the long dark night of despondency'.

Works such as Carron — with its high walls and doors guarded by porters, smoke belching from the furnaces and the vast range of new goods which appeared on the market — attracted visitors, most famously the poet Robert Burns, who was refused entry.

New Lanark drew thousands who, after 1813, flocked to see Robert Owen's Institute for the Formation of Character, a school and educational method designed to create a harmonious mill community.

Amongst those who came were William Wordsworth, the Romantic poet, and his sister Dorothy. Less welcome were industrial spies such as the Swede Eric T Svedenstiera, who in 1802 included Wilsontown Iron Works in Lanarkshire, along with New Lanark, in his Scottish itinerary. Scottish 'factory farming', too, was greatly admired.

The first phase of Scottish industrialisation owed much to English technology and labour, but it

Countryside industry began to retreat and urban steam-power took over

was not long before the Scots themselves were able to contribute to their own Industrial Revolution. Scottish influences, never absent, also began to be felt more acutely in England and even further afield as men like Thomas Telford (1757-1834) made his mark on road, bridge, canal and dock building, and William Fairbairn and others made Scotland's reputation in engineering.

The best-known Scot of the Industrial Revolution is James Watt (1736-1819), mathematical instrument maker at the University of Glasgow, who developed a much more efficient steam pumping engine, patented in 1769. Earlier Newcomen engines, mainly used to pump water out of mines, were wasteful both of coal and steam.

Ironically, Watt had gone south to manufacture engines with his partner Matthew Boulton of Birmingham, and Boulton and Watt engines were slow to appear in

Scotland. It seems that James Stein, at Kilbaggie distillery, was the first to employ a Boulton and Watt engine north of the Border. But a revolutionary Watt invention, rotary motion (1781), achieved by the sun-and-planet gear, enabled textile manufacturers to employ steam power to drive textile machinery.

By the end of the 18th century, industrialisation in the countryside was in retreat, as the urban steam-powered mill and factory increasingly became the norm.

But there are numerous, less well-publicised figures who made invaluable contributions to industrialisation. Unsung heroes include three generations of the Meikle family, who between 1710 and 1811, worked on a variety of water-mill improvements throughout Scotland.

In cotton, James Smith, manager at Deanston, improved carding machinery, whilst New Lanark's



manager during the 1790s, William Kelly, improved the water-powered mule and devised a system of heating mills with hot air ducts, thereby reducing the risk of fire.

Robert Thom made major strides forward in the use of water power. This happened first at Rothesay cotton mill, but most notably by his providing Greenock, through the construction of Loch Thom reservoir, with exploitable water courses for industry from 1827.

In 1802 David Mushet discovered blackband ironstone in central Scotland. With the invention in 1828 by J B Neilson of the hot-blast process, the blackband could be exploited.

At a stroke production costs in

TIMELINE

1759

The Carron Iron Works are established near Falkirk.

1760

Industrial trend begins to draw women into work at much lower rates of pay than men.

1768

Act of Parliament for the Forth and Clyde Canal, the first such waterway in Scotland.

1770

The Clyde is dredged and deepened as work progresses on the Forth and Clyde Canal.

1771

Glasgow's Tobacco Lords import 48 million pounds of tobacco via the Clyde.

1778

First cotton mills get going in Scotland at Penicuik and Bute.

1785-6

David Dale leads establishment of New Lanark cotton works.

1790

The 35 mile-long Forth and Clyde Canal opened to traffic.

1793

The 12 mile-long Monkland Canal, designed to assist colliery development, opened.

1799

Robert Owen, social idealist and entrepreneur, purchases New Lanark for £60,000.

1800

Perhaps 500 pauper children employed at New Lanark from as young as four years old.

1801

William Symington's Direct-drive steam power fitted to second 'Charlotte Dundas'.

1812

Henry Bell's 30-ton 3hp Comet begins the first commercial service on the Clyde.

■ Before the mills came: the site of New Lanark was a 'breathtakingly beautiful valley'.

Scotland were slashed, thus giving Scottish pig-iron producers a major competitive advantage. Scotland's share of UK production rose from five to 25 per cent.

Accompanying developments in engineering and shipbuilding – Henry Bell's steam-driven Comet sailed across the Clyde in 1812 – established the west of Scotland as the country's heavy engineering centre.

But nowhere in Scotland escaped the effects of industrialisation.

Dundee continued to manufacture linen and by the 1830s had become the leading centre in Europe for mill-and-factory-made coarse linen.

Scottish bleaching, backward in the 1720s, was by the end of the century as good as anywhere else in

Europe. With the establishment by Charles Tennant in 1799 of the works at St Rollox for making bleaching powder, Scotland became the world leader in chemical production and soon boasted Europe's largest plant of this sort.

In the Borders and the Hillfoots woollen mills mushroomed. In 1790 Scotland had had hardly any; by 1835 there were 90. Paper making, too, expanded, as demand from book and newspaper publishers grew, along with the needs of commerce for ledgers.

Even the Highlands and Islands were affected. Land was cleared to create sheep farms by estate proprietors who wished to benefit from the rising demand from the

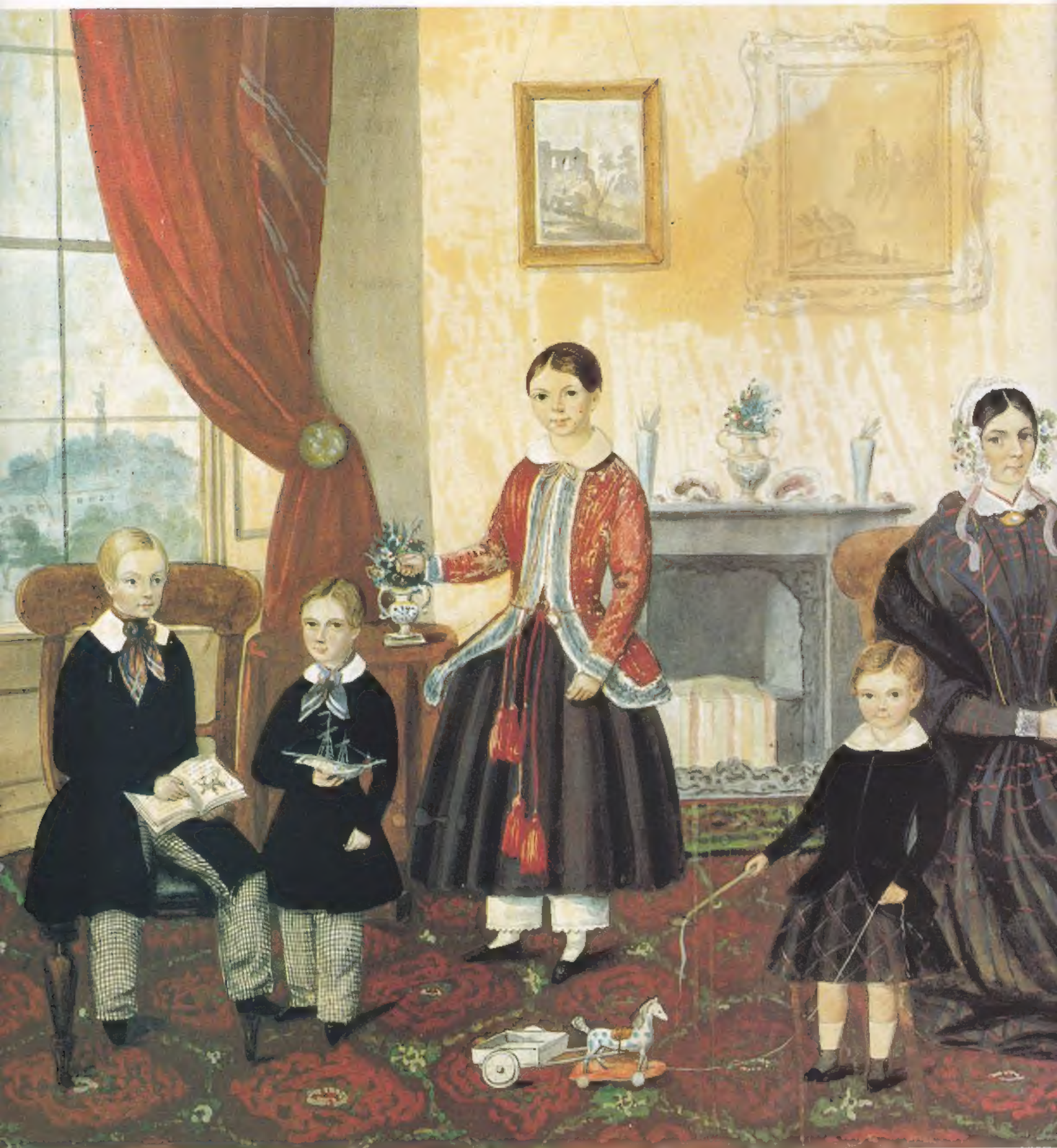
south for wool and mutton.

The first crofting communities, located on the coastal fringes, alongside sea lochs and comprising tenants removed from the land, were supported by the cold, wet and laborious kelp-making industry, with the ashes from burnt seaweed forming an alkali which was sought by glassworks.

Illicitly-distilled whisky, too, was sold in Lowland Scotland.

Industrialisation also extended the flow of seasonal migrants from the Highlands who worked not only in the harvest, but also in bleachfields, and on canal and railway construction schemes. ●

Tobacco Lords rule



the Atlantic waves

■ Meet the Mahoney family: Mr Mahoney was a Glasgow merchant who became one of the new tobacco tycoons. Their rich style of living on Montith Row came from wealth beyond the dreams of other families. The tobacco trade nose-dived after the American War of Independence, but by then many of the merchants had diversified into other areas – and their expertise was in demand in the New America.



European sea trade was booming. Scotland was in the thick of it. Leading the pack were astute Glasgow merchants who had cornered the trade on a plant that everyone wanted to smoke

During the 17th and 18th centuries, the Atlantic Ocean teemed with ships carrying goods, people and information between the countries of Europe and their colonies in Africa and the Americas. Increasingly, Scots played a crucial role in this world of transatlantic exchange.

Glasgow merchants exported Scottish commodities to the colonies, occasionally transferred slaves from Africa to the Americas, and imported produce from colonies in the Caribbean and North America. Pre-eminent among these import trades was tobacco.

At its height, Glasgow was Britain's key tobacco centre. It imported vast quantities from Virginia, Maryland and North Carolina in North America and distributed it to markets in Britain and Europe. The huge profits were invested in trade, finance and industry, and in mansions and estates. This new elite, the 'Fords', dominated Glasgow economically, politically

Before the Act of 1707, English laws restricted Scottish access to their trade law notwithstanding

By 1700, about eight million pounds of tobacco was imported in the Clyde ports

Within 12 years, imports had risen to 14 million pounds. This meteoric rise continued and in 1712, over 48 million pounds of tobacco arrived in the Clyde

By the early 1770s, the value of this tobacco represented some 75 per cent of all Scottish imports from North America and the West Indies

The vast majority, more than 90 per cent of all British imports, were lifted

In 1707, the Act of Union swept away the mercantile laws limiting Scottish access to the previously English Empire. Across the globe, Scots began to seize new opportunities in the Caribbean, India and in North America

Gradually, they began to establish new trades. In Glasgow, merchants took a larger share of the trade in tobacco. By about 1715, Glasgow became the second most important tobacco port in Britain

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■ The smuggler's adieu: a reminder of the 'alternative economy' which provided rich pickings for some Scots businessmen.

► per cent, was re-exported from Scotland, and represented 52 per cent of all Scottish exports, including commodities and manufactures produced at home. But how is this extraordinary growth to be explained?

Foreign demand probably began the process. In 1740 there was a shift in French policy towards purchasing in the British markets. Attracted by the extensive banking facilities north of the Border, the French began to buy enormous quantities from the Clyde. By 1747, two thirds of tobacco exports from Glasgow went to France. This new market in France, as well as rising demand in Britain, forced Glasgow merchants to increase their imports from the Chesapeake.

To oversee this expansion in North America, the Glasgow merchants employed representatives in the colonies. By the 1740s, there were (with a few exceptions) two ways of trading.

The first was the consignment system, where merchants would ship produce from the colonies and sell it, on behalf of the planters, in British markets. Under this system, the crop remained the property of the planter until it was sold. This meant the planter was responsible for insuring the tobacco while the value of his crop remained at the mercy of the market.

Glasgow merchants, on the other hand, perfected an innovative form of mercantile organisation known as the 'store system'. Under it, employees of the great mercantile firms lived in the colonies, and purchased tobacco directly from the planters.

The tobacco was thus the property of the merchant when it left the colony. While this increased the risk for the merchant – from the dangers of the voyage, the fluctuations of the market and the insecurities of credit extensions – it also had a number of advantages.

Factors for the Glasgow merchants tended to make purchases from small-scale farmers in the inland Piedmont area of the Chesapeake, rather than from the great tidewater planters nearer the coast.

Tobacco would be brought to the coast along the extensive Chesapeake river system and would be waiting on the dock for the arrival of ships from Scotland. As a result, the 'in-

country' time for Glasgow ships was relatively short, meaning that they could be sent back to market quickly and efficiently.

This efficiency was reinforced by Glasgow's geographical position. The sea crossing from Glasgow to the Chesapeake was the shortest of any route between a major British port and the tobacco-producing regions.

In terms of sailing time alone, a return voyage from Glasgow to the Chesapeake could be three weeks

to expand. Mercantile activity in the Atlantic World was an expensive undertaking. Ships had to be hired or purchased. Captains, crews and employees on both sides of the Atlantic had to be paid. Crucial stores had to be established and credit had to be advanced to the colonies.

During the 18th century, Glasgow merchants had access to a number of sources of investment.

The expansion of the Bank of Scotland, the Royal Bank of Scotland

in London or Bristol, Glasgow companies were distinguished by their number of partners. In London, companies tended to have three partners; in Glasgow it was likely to be six or more.

This immediately provided the firms with larger pools of credit from which to draw.

Equally important was the distinctive Scots partnership law. Under Scots law, the entire partnership was a legal entity which conferred security of numbers on individual investors.

Furthermore, investors could only earn five per cent on their investment, ensuring the vast majority of profits remained within the firm.

Important, too, was investment from outside the tobacco trade. The Scottish economy after 1740 began to show real signs of benefiting from the Union. Increasingly, landowners, industrialists, financiers and other merchants made investments in Atlantic trade.

Indeed, the webs of interconnection between tobacco lords, Caribbean merchants, factory owners, and

Even the aristocracy came to terms with the wealth of Tobacco Lords, who also packed hefty political clout

shorter than the one from London.

The provision of supplies, the widespread extension of credit and the reliability of the crop price under the store system also ensured loyalty from the smaller planters. As a result, the Glasgow merchants had a steady supply of tobacco to meet the rising demand.

The growth of Scottish banking that had so attracted the French may also explain why the trade was able

and the Glasgow banks to finance the tobacco trade. Glasgow's financial institutions, in particular, were dominated by members of the tobacco elite.

Yet while these institutions did service the needs of the tobacco lords, they were not the only or even the major sources of finance.

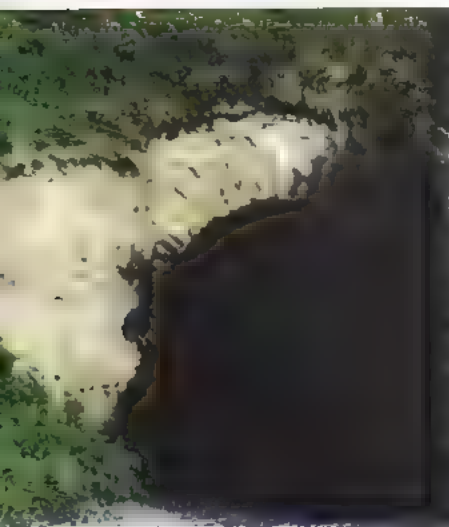
The explanation for the culture of investment in Glasgow lies elsewhere. Unlike merchant houses



THE Smuggler's Adieu



■ Symbols of success: a Scottish merchantman sits atop the globe, but the cigar store 'black Red Indian' with slave connotations is less attractive.



■ Smugglers' den: at Cove Harbour, Cockburnspath.

landowners is striking. In many cases single families filled all these roles.

The enormous wealth of the tobacco lords and the importance of their trade allowed them to dominate the city of Glasgow.

Just as other investors were attracted by the lure of tobacco profits so, too, did the tobacco lords

seize alternative investment opportunities. Some of them were partners in Glasgow's banks. Several others diversified their transatlantic operations by moving into the Caribbean.

In the years after the American War of Independence, the 'sugar aristocracy' replaced the tobacco lords, though some of the personnel remained the same. They also invested in the burgeoning industries of west and central Scotland, with textile, mining and metal work being among the most popular.

Befitting their status as tobacco lords, they also invested in highly visible manifestations of their wealth. Throughout Glasgow, handsome new mansions were erected. In the countryside, estates were purchased, providing the mercantile class with the veneer of landed gentrification.

And while historians have often noted a clash between the old landowning families and these nouveau riche traders, the latter were also to be found mixing socially with the former in country houses and at balls. Not even the

aristocracy could ignore the wealth of the tobacco lords.

As an enormously-important economic group in Glasgow, the tobacco lords had tremendous political clout. In alliance with other colonial traders, they contrived to tower above the city's political landscape throughout the second half of the 18th century. Few, if any, provosts after 1750 had no colonial connection.

The city council was dominated by the tobacco interest, while parliamentary constituencies in the city, and those around their country estates, fell into their hands, providing them with influence in the highest echelons of London power.

Yet despite their huge visible presence in Glasgow, the tobacco merchants' influence in the city was not as great as it seemed.

The American Declaration of Independence in 1776 presented an enormous problem for the tobacco lords. The colonies that had been their main market were now the enemy.

After 1776, the colonies' status was in doubt, and after 1783, and the end of the American War, they were no longer part of the British

Empire.

The War itself disrupted the production of tobacco in the rebellious colonies and, with France's entry to the war, the threat to the sea routes to the Atlantic. This was a disastrous collapse of the trade with disastrous effects for the tobacco lords.

Yet many of them survived. Their investments in West Indian trade and planting began turning their losses into profits. Others were able to diversify into other areas of business. More important, though, was American expertise.

As colonies, the Americans had been dependent on Britain. The Chesapeake planters relied on Glasgow for credit and for a market.

Immediately after America gained political independence, for practical purposes some mercantile relationships returned to their pre-independence position. As the new American republic consolidated its position, however, the role of the Glasgow merchants declined.

After the 1780s, they no longer dominated Glasgow as once they had. ■



■ Women at work: a spinner on her factory machine around 1880, when the peak of the industry was over. The pay was poor, hours long and conditions entirely unacceptable by today's standards.

'SHOCK TROOPS' OF THE REVOLUTION



The lives of women and children could be purgatorial. They were industry's cheap labour when cost containment was viewed as critical



■ Unions began to develop as friendly associations, and here is the spinners' motif on a tray.

One of the most striking aspects of Scotland's Industrial Revolution is the degree to which it depended on the labour of women and children. In the 1820s, around two-thirds of those employed in manufacturing in Scotland were women, youths and children. Less than a handful of industries including coopering and ship building employed no women.

In the wider European context this is not unusual. It is a feature of the period, however, which needs to be emphasised and explained. So, too, does the fact that in Scottish industries like cotton and flax spinning the ratio of females to males was considerably higher than it was in England.

There was nothing new about women's work in the middle of the 18th century, as industrialisation began. Women had long laboured in the fields, spun and knitted to provide for family clothing, and been responsible for the myriad of tasks involved in raising children and managing a household. But less is known about the extent to which women worked for wages.

Much paid work was casual, with females being employed to remove stones from a field for sixpence (2 5p) a day, for example, or on harvest tasks.

Other work could be more permanent, in the case of coal bearers for instance, who were employed either by their husbands or another male hewer to carry great baskets of coal from the pit bottom to the pit head. Females

were rarely found hewing coal.

At the smaller saltworks, which lined the banks of the Forth estuary in the 17th and 18th centuries, women and children were frequently employed as assistants in the salt pans, managed by a male relative – usually the husband or father respectively.

Here, as in the mines, the assumption was that skilled tasks would be carried out by males. The sexual division of labour was to become even more marked with industrialisation and the emergent ideologies of 'domesticity' and separate spheres.

These had the effect of removing most women from the formal world of work. It has become apparent, too, that considerable numbers of girls in their teens – as many as one in 10 in the 1690s – migrated from the countryside to the larger towns to become domestic servants, or to find a marriage partner. Others became farm servants.

They moved more often and further than males. From the 17th century, single women can also be found entering apprenticeships as buttonmakers and mantuakers (dressmakers). We next find women, single and married, opening shops in large towns like Edinburgh, and in smaller towns like Glasgow.

Wet nurses, who were often mothers, could earn money by providing breast milk to the infants of mothers who could not afford to give up work, and the offspring of the better-off.

Graveclothes-making was another

occupation for which there was always a certain level of demand. A number of book manufacturers were female and, from Medieval times, it had been commonplace for women in towns to brew and sell ale.

Many wives helped their husbands to run businesses, particularly through selling the goods such as butter, fish and meat in which their husbands dealt.

The linen industry had expanded in the 17th century and continued to grow more and more important with the cash economy. As many as six women were needed to supply a single handloom.

The spinning arc is where the most dramatic changes were to be seen. As the 18th century progressed, the costs of bleaching, drying and finishing linen cloth in Scotland was higher than in the Netherlands, even though spinning and weaving in Scotland were cheaper. The master bleacher at Salton bleaching, therefore, was instructed that 'no men were to be employed upon what a woman can perform'. A trend was set so that by the 1840s three times as many females as males were employed at bleaching fields in the west of Scotland, all at lower rates of pay.

Hours of work were 'longer than those found to prevail in any other

Waiting game: the shop is empty, but this Glasgow shopkeeper has the change all ready for the next customer. The paper-wrapped cones on the counter and shelves are sugar loves.





► department of labour'. Working conditions were reprehensible in a process which was carried out in all weathers, but with much use of boiling water and dangerous chemicals. Employers were fortunate because in Scotland there was a great untapped pool of under-employed women

The average age for marriage seems to have been around 26 or 27. As many as one in five women in Scotland at the end of the 18th century remained celibate. There were twice as many single, unsupported females amongst the poor as men. Many wives were deserted.

Consequently, there were large numbers of females who had to support themselves and were desperate to find a means of

work or to contribute in some other way to the family economy.

Examples abound of women and children foraging for coal and cinders for fires, and of females wheeling, dealing and stealing on behalf of their families.

From Glasgow in 1834 it was reported that 'hundreds of boys, girls, elderly people and worn out prostitutes' were eking out a living 'gathering manure, old iron, rags and similar articles from dunghills' and then selling what they scavenged for a few pennies. Orphaned children and those of poor parents provided a cheap source of labour.

The iron company at Carron, which also made nails, could not compete with the more efficient nailmakers of Staffordshire. They found that boys from the Charity

which attracted employers to women and children. It could be difficult to persuade males to adapt to the regular routines of mill and factory work. Women and children, it was felt, were more 'tractable'. Smaller children could crawl under spinning machines to mend threads.

Skills specifically associated with females were sought. In Glasgow in 1762, Robert White, who was employing women to sew stockings, found himself in court at the behest of the Tailors' Incorporation, who wanted to protect the trade for males. White's defence was not only that women workers were cheaper, but also that they performed tasks such as stitching and sewing with greater 'exactness' and 'more expedition' than male journeymen.

Although there is no doubt female and child workers were exploited during the 18th and 19th centuries, they were not without a voice, or other means of expressing their feelings.

Children sometimes fled the mills, despite the risks of being caught and punished by being beaten and imprisoned. But in the early country mills around Dundee, for example, they had been locked in their dormitories at night anyway, while the mill windows were kept shut. They had little to lose and, for some, even life in the army was preferable.

In Forfarshire, so hostile to the new spinning mills were the female hand-spinners that it was reported that they were 'all up in arms' and threatened to 'burn them down'. Some of the bitterest anti-employer songs sung in Glasgow in the early 19th century, were composed by women during industrial disputes in the 1820s.

Experience, however, was variable, and the indications are that most soon became aware of the material advantages of a regular wage. In some works, New Lanark, for example, under the benevolent regimes of David Dale and Robert Owen, visitors were impressed by the health, vitality – and orderliness – of the children.

And, notwithstanding the appalling discomfort of many works and the disamenities of town life in the early 1800s, former rural dwellers flocked to join the emergent industrial army.

But the period of domination of Scottish industry by female and child labour was short-lived. As the importance of textiles declined in the 1830s, the heavy industries in which male labour would predominate came to the fore. ●



■ Pithead workers: mining women faced a life of hard labour.

subsistence. Begging was one solution, but the right to beg was restricted.

Paid work was another, from a variety of sources. A good example is Stonehaven-born Jean Wood, who was banished from Perth as a vagrant in December, 1777. Prior to this, however, she had worked in a brewery for 10 or 11 weeks, gone to the harvest for seven weeks but since then had been engaged 'by the day to anyone who employs her'. It was not enough to keep her out of sight of the authorities.

Nor was marriage necessarily sufficient to keep a woman or her children out of the labour market. Even the wives of professionals in Scotland – the wives of ministers and surgeons for example – often had to work. Recent research shows that amongst the labouring classes it was only bachelors in full employment who could enjoy anything approaching a comfortable standard of living before around 1750.

For a household to survive, it was usually essential for the female and child members either to find paid

work or to contribute in some other way to the family economy.

House in Edinburgh could successfully be used to replace adult male workers. At New Lanark there may have been 500 pauper children by 1800, employed from as young as four years old. In the mills, however, they were usually turned off in their mid-teens, when they would have to be paid adult wages.

This was unlike the coal industry, where children were taken underground as 'apprentices' by their male relatives at an early age.

This was done in order to avoid paying non-family members to carry coal or for other labouring tasks, but also to ensure the skilled mining jobs would be kept in the family.

It is because it was children from backgrounds such as these, who experienced at first-hand and with no choice, the alien regime of the workshop, mine, mill and factory, where work was regulated and closely supervised, sometimes roughly – and poorly paid, that they have been described as the 'conscripted shock troops' of the Scottish Industrial Revolution.

But it was not just their low price

Industrial pace picks

■ There she puffs! Henry Bell's 30-ton Comet makes its maiden voyage in 1812 as the first commercial service on the Clyde. The painting is by artist John Knox.



up at 6mph flat out



Vital supplies by canal helped to push forward the Industrial Revolution, even if steam engines blew up and cargoes were delivered at the speed of a snail

Barges and steamboats on canals and rivers helped drive forward the Industrial Revolution in Scotland. They represented the only real competition to the turnpike roads and stage coaches before the railways. Today, with the Crinan and Caledonian canals in active use, a new Millennium Link will soon restore navigation on the Forth and Clyde, and Union canals.

During the 18th and early 19th centuries, agricultural improvement and industrialisation were accompanied by a transport revolution on land and sea.

It was invariably undertaken by those who stood to gain most from markets in towns or abroad – landowners, farmers, merchants, and textile, coal and iron masters.

As the revolution proceeded Scottish (and English) engineering giants transformed the landscape with major transport developments.

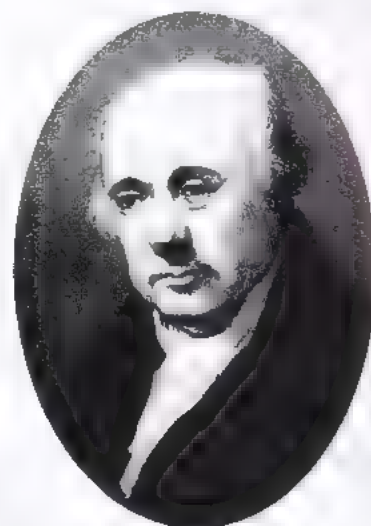
In the pre-railway era, the most significant in scale were the canals, river navigations and associated harbours, all of which have left a fascinating heritage that can still be seen on the ground today.

An obvious starting point was the improvement of existing waterways and harbours, mainly but not exclusively in the Firths of Forth, Tay, and Clyde, and Moray Firth.

These estuaries had old-established harbours such as Leith, Dundee, Perth in the east, and Greenock, Irvine and Ayr in the west, all engaged to varying degrees in coastal trade and overseas trade with Europe, Ireland and the North American colonies.

While major harbour works were constructed at these and other ports, perhaps the most important long term development was the founding in 1668 of Port Glasgow as an outpost of Glasgow.

The city itself could only be reached by small vessels until the



■ William Symington devised the first practical steamship.

sandbars in the upper estuary were cleared and the Clyde itself was dredged and deepened beginning a century later in 1770. Thereafter Glasgow and the Clyde took off as centres of the colonial trade.

On the face of it, Scotland did not seem to offer the same opportunities as, say, the English Midlands around Birmingham and the Black Country, for canal building.

Nevertheless, the four canals built in the Lowlands made a substantial contribution to the development of agriculture, industry and trade in the Forth and Clyde valleys. They were particularly useful to the local coal and iron industries.

The earliest was the Forth and Clyde, an Act of Parliament for its construction being obtained in 1768 by a consortium of merchants, landowners and others. Prominent engineers – such as John Smeaton, James Brindley (who built the Duke of Bridgewater's famous coal canal near Manchester), and steam engineer, James Watt – were all consulted about the best route.

As with most canal schemes of the period the engineers tried to follow the contours as much as possible, to ►

■ The industrial revolution placed an increased importance on water transport and the needs that went with it – canals, aqueducts, tunnels and road bridges. Scots engineers Thomas Telford and John Rennie were the leading bridge-builders of their day and Rennie found further fame with Waterloo Bridge over the Thames, completed in 1821.



► cut down the cost of expensive tunnels, aqueducts and locks which were needed to raise and lower the barges and passenger boats from one level to another. The Forth and Clyde, as it happened, had two complex series of locks at either end and others along its length.

Because there were so many interested parties, including the Carron Company, who owned the famous ironworks near Falkirk, the project was dogged with financial difficulties. But by 1775, contractors with gangs of navvies (or 'navigators', as they were then called) had succeeded in digging out thousands of tons of earth and rock along the route and the Forth and Clyde was at least partly opened from Grangemouth. A new harbour was built near the mouth of the River Carron, to Stockingfield, north of the River Kelvin.

Twenty-two years after the cutting of the first sod, the 35-mile canal was open from sea-to-sea in July, 1790 – with an important branch carrying navigation to Port Dundas in Glasgow and beyond to a junction with the Monkland Canal.

The Monkland Canal, 12 miles in length, was a shorter but nonetheless vital link as a coal

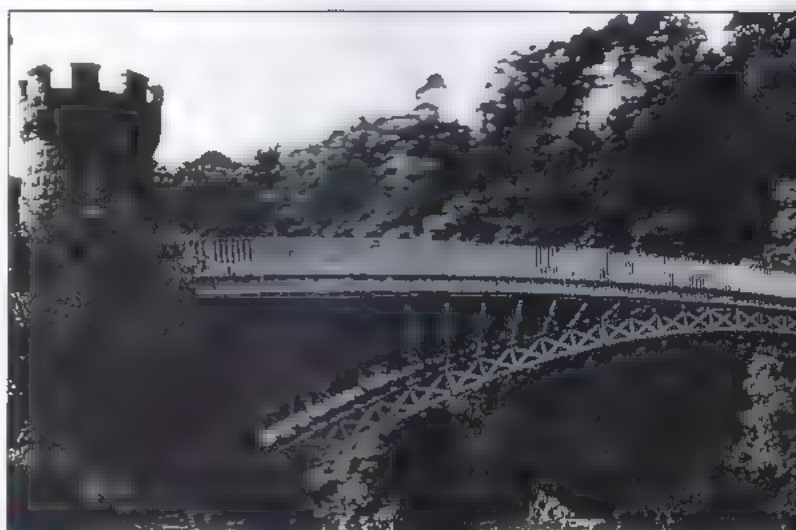
carrying canal, helping to develop the collieries in the parishes of Old and New Monkland. Begun in 1770, with Watt again acting as consultant, it was finally opened along its full length in 1793. As with the other canals in colliery districts, wagonways were built as extensions to the waterway carrying the coal to wharves for shipping to towns or iron furnaces.

During the Scottish equivalent of the 'Canal Mania' south of the Border, several other canals were proposed, but only two of any consequence (discounting the Crinan project) were actually built.

The Glasgow, Paisley and Johnstone Canal, opened in 1811, was really just the eastern section of a much more ambitious plan to link Glasgow with Ardrossan harbour on the lower Firth of Clyde.

On the other side of the country, the Edinburgh and Glasgow Union Canal – more often known simply as the Union Canal – opened in 1822, linked up with the Forth and Clyde by a series of locks at the inland Port Downie, near Falkirk.

The famous engineers John Rennie and Thomas Telford, were both consulted on the project. Much of the work was carried out by Hugh



■ Telford's iron bridges broke new ground, like the Craigellachie Bridge.

Baird, the canal company's own engineer. This is a very interesting contour of the canal, built on the level of the many outstanding engineering features, including a 650-metre tunnel at Falkirk and three superb aqueducts over the rivers Avon and Almond and the Water of Leith.

As a result, Edinburgh had its own port, Port Hopetoun. West Lothian became one of the most productive farming counties thanks to tons of

manure transported from the city, and passengers could make the trip from Edinburgh to Glasgow in 14 hours for a fare of 5s in the cabin and 3s 6d steerage.

In contrast to the essentially industrial canals of the Lowlands, the Aberdeenshire Canal ran through the rich farming countryside of the Don valley from Aberdeen harbour to Inverurie.

A parliamentary act was proposed by 'certain noblemen and



gentlemen' and passed in 1796, the proprietors being authorised to raise £20,000 in 450 shares. John Rennie was appointed consulting engineer and after several false starts and the usual financial crises the canal was built and opened to traffic in 1805. It was used to transport farm produce and granite.

Finally, two vital links in Argyll and the Highlands survived longer than any of the Lowland canals – the Crinan, linking the Firth of Clyde with the west coast, and the Caledonian, linking the Atlantic with the North Sea via the Great Glen.

Watt advised on the Crinan – a short but magnificent example of canal engineering opened in 1801, which still preserves original features, basins, locks, bridges, and towpath.

Many schemes were devised for a canal linking the lochs of the Great Glen and in 1803 the project went ahead with Telford as principal engineer.

The route was surveyed and settled on in consultation with Watt and Rennie and work began in 1804.

The project was dogged with financial and engineering problems and when finally opened from sea to sea in 1822, the 60 mile long waterway had cost over £800,000 – a

huge sum for the day. The Caledonian never became an important canal, yet in the long term proved useful to fishing boats, coasters and tourism.

Like the Forth and Clyde, and the Union, other canals provided passenger services, at a few miles per hour in horse-drawn barges, not particularly fast, but altogether more comfortable than coach travel even on the best turnpike roads.

At the same time, Scottish canals provided a useful testing-ground for another invention of longer-term importance – steam navigation.

Many individuals played their part including the banker and Dumfriesshire landowner, Patrick Miller of Dalswinton, who supported the efforts of the engineers, William Symington and John Taylor, to link a steam engine to paddle wheels pushing a boat through the water.

The first steamboat trials on Dalswinton Loch, supposedly attended by Robert Burns, took place in 1788.

Miller then commissioned Symington to design and construct at Carron ironworks a larger engine, which he fitted in a 60ft double hulled vessel with paddle wheels on the Forth and Clyde Canal in 1789.

Named Charlotte Dundas, the

vessel was a great success, moving 'free and without accident' (early steam engines tended to blow up unexpectedly) at 6.5 mph.

This experiment encouraged Symington to develop an engine giving direct drive to the paddle wheels, an idea patented in 1801.

The second Charlotte Dundas was the result, a 58ft long vessel which managed to tow two sloops for 18 miles along the canal.

Watching all this was another Scottish inventor, Henry Bell, who had worked with Watt and Rennie, and tried his own experiments with steamboats about 1800. His appeals for government assistance, which he might have expected during the Napoleonic War, fell on deaf ears.

He also faced competition from the United States, where Robert Fulton sailed a steamboat on the Hudson River in 1807. But Bell persevered and, in 1812, the Comet, a 30 ton vessel driven by a 3hp engine, began the first commercial service on the Clyde.

Bell had proved the potential of steamboats, which were soon to be found in large numbers on the Firth of Clyde and other navigable estuaries.

Until the 1840s and 1850s the

canals were a vital means of transport for the places they reached, but in the face of railway competition slowly declined, though the Forth and Clyde still carries 700,000 tons of goods in 1913.

It was also famous for its steamboat excursions, hugely popular with the public, because under quirky licensing arrangements alcohol could be consumed on board. The Forth and Clyde closed in 1963, leaving only two commercial waterways, the Crinan and the Caledonian.

While the other canals were officially set aside, there was considerable interest in their recreational value and many conservation schemes brought about redevelopment from the 1970s.

This will culminate in the reopening of the Forth and Clyde and Union canals in the Millennium Link, an ambitious scheme which seems likely to ensure the future of these historic waterways.

Paradoxically, the Glasgow end of the Monkland canal is now buried under the M8 motorway on a stretch notorious for queuing. Drivers can reasonably reflect that their progress by horse-drawn barge might have been quicker and less stressful if they had been travelling in the 1800s. ●



■ A model of the second Charlotte Dundas designed by Symington.

DIRTY TALK DOWN AT THE MEN'S CLUB



■ Put down the whip, it's a raid! Police step in to spoil a cosy little supper party near Blythswood Square in Glasgow.

**Naked girls, mouth
stories, rude
toasts in naught
glasses, then club
were dedicated to
celebration of sex**



The 18th century was a great age of clubs in Scotland and the rest of Britain, where men could escape the 'inhibiting' influences of wife and family and enjoy socialising together. There were clubs to suit all tastes, from the posh to the plain, the serious to the absurd – and the debauched.

The suspicion that when men wanted to be alone together it was so they could get drunk and talk dirty had a good deal of truth in it.

What more universally inspiring a subject to unite men than the alcoholic celebration of sex?

In spite of the veneer of Presbyterian respectability that lasted for much of the century in Scotland, below the surface many were reacting against it, and in many clubs male bonding was helped by conscious obscenity, flouting conventional values.

Such deliberate naughtiness occasionally went further, and remarkable records and relics survive from two clubs which proclaimed sex as their main interest.

In 1732 the Beggars Benison was founded in Anstruther in Fife. Local merchants and gentry met to uphold the cause of 'fair trade', a double entendre which gave members endless amusement.

Fair trade was code for free sex, but also referred to smuggling, an almost universal patriotic obsession of the age, and the club in fact, in timboly alliance, both smugglers and customs officers among its members.

To add a bit of extra spice, a pinch of Jacobitism was thrown into this bizarre mixture, with previous monarchs judged by sexual prowess.

Sex was celebrated through obscene talk, song and joke.

Ritual initiation required members to provide explicit proof of their virility.

Local girls were hired to be viewed naked, and lectures were given, surprisingly

sensible, urging that sex should be responsible (employing contraceptives) as well as free.

The idea of a club dedicated to sex, born in Fife, caught the fancy of many, and branches opened in Glasgow and Edinburgh – and even St Petersburg, in Russia.

The presidents or 'sovereigns' of the Benison took to issuing diplomas granting honorary membership to notables, from the Prince of Wales (later George IV) to Vincenzo Luvardi, the Italian long-distance balloonist.

The toast 'the Beggars Benison' (code for a motto blessing a man's most important possessions, genitals and his wallet) were drunk in aristocratic circles in London.

But times and sensibilities



■ Oval-shaped Beggars' Benison Club medal dated 1739.



■ Sexy club medal: as issued by the Beggars' Benison Club, founded in Anstruther in 1732.

changed, and it came increasingly to be seen as shocking that gentlemen indulged half-openly in such obscenity. The club withered, and died in 1836.

The second major Scottish sex club, the Wig Club, founded in 1775, was rather different from the Benison.

The older club had, in social terms, a wide range of members, whereas the Wig was highly exclusive. Its members were drawn entirely from the Scottish Tory establishment of the day – aristocrats, rich gentry, senior army officers, members of parliament.

The club avoided the vulgarity of the Benison, requiring no proof of manhood, calling in no naked girls. Nonetheless, its dedication to sex was still crudely genital. Toasts were drunk from glasses modelling the male genitals – and they were drunk to the wig that gave the club its name.

This relic was, supposedly, made from pubic hairs culled by King Charles II from his mistresses, and it thus symbolised happy promiscuity.

But, in time, the Wig went the way of the Benison – as belonging to the club, once an elite honour, became an embarrassment.

Membership fell, and it dissolved in the late 1820s.

PAST PERFECT BUT CHALLENGES AHEAD

The east Princes Street scene around 1814: the focus of the day were hansom cabs, Waverley Station was still in the future along with the Balmoral Hotel, ladies wore pavement sweeping dresses and the gentlemen top hats. North Bridge is on the left and the street behind the railings on the right is what we now know as Waverley Bridge.



The fair face of central Edinburgh is owed to the visionaries of the past. Today it is a hard fought battle to keep that legacy intact



When Edinburgh's Lord Provost George Drummond stood on the Castle ramparts in the cramped

Medieval Old Town and surveyed the scene to the north in 1752, the view was one of almost uninterrupted countryside, with only a few houses, all the way to the Forth.

This was to be the site of Edinburgh's New Town. But if Drummond's dream of a great and beautiful capital were to be realised, then from the beginning it had to be planned with meticulous care as well as vision. So Edinburgh 'spies' were sent to London, Paris, Berlin, Turin and Vienna, where extended towns had already been built, and it was found the style, scale and progress in London was leading the field. The rivalry between the two countries merely acted as a spur.

The first challenge was to turn the Nor' Loch and marsh below the Castle Rock, where the railway runs today, into an attractive canal. The loch had been created to bolster the city's defences and at one time witches and wizards were dunked there. By mid 18th century, however, it had degenerated into a stinking cesspit, the dumping ground for butchers' waste from the Fleshmarket, along with dead dogs and gurdyloo. The canal was never built, but drainage began in a hurry in 1759.

The North Bridge was the next priority. The deep valley between the old and what was to be the new Edinburgh had to be spanned and in 1762 Drummond laid the foundation stone. It took 10 years to complete the 1,134ft bridge and five workmen lost their lives in the process when an abutment collapsed.

The challenge to produce the all-important New Town plan was taken up by six contenders. Money was no problem, because it was made clear from the outset that the honour of having the plan selected was reward enough – along with a gold medal bearing the arms of Edinburgh.

The precocious 23-year-old James Craig was deemed winner and to the annoyance of the Town Council it was found he had already named streets on his plan. Princes Street was St Giles Street, which upset King George III because it had reference to a nasty little street in London.

In the beginning, there was no wild rush for New Town homes by would-be purchasers. In fact, the first house required a £20 inducement to get the building programme going. The plot was bought by a Mr John Young for a mansion in George Street. The first completed building was in Thistle Court, which is still in use today and bears a No 1 on its nameplate.

The first major public building was Robert Adam's magnificent Register House, facing up North Bridge. The project was helped with a £12,000 donation by the Treasury from the forfeited Jacobite estates. Register House was important because in a single building it set the standard and tone for everything to follow.

The New Town progressed westwards. St Andrew Square, for example, was already occupied by some of Scotland's leading figures and hansom



■ Green oasis: Princes Street Gardens remain one of the prides of Edinburgh.

cabs were plying to shops, clubs and businesses in the Old Town by the time the builders reached Charlotte Square at the other end of George Street in 1791.

At the height of the foundation diggings, more than 1,800 horse-drawn cartloads of earth and rubble were being dumped each day at a site half way along Princes Street. The high, unsightly pile became known as the Mound and the name has stuck to this day.

The building of Charlotte Square at the westerly end of George Street was the final flourish of the first New Town. In particular, Robert Adam's north side is exquisite, bringing visitors from around the world to admire Georgian splendour at its finest. The National Trust for Scotland's Georgian House is located there and is open to the public to give an idea of the gracious lifestyle of the period.

Then the New Town adornments began to be put in place. The first church was St Andrew's in 1784, with its delicate spire half-way along George Street. The upturned telescope of the Nelson Monument on Calton Hill, designed by William Burn, was erected in 1807 and the 136ft sculptured Doric column to Henry Dundas, the 'Uncrowned King of Scotland', became the focal point of St Andrew's Square in 1821, reflecting Trajan's Column in Rome.

Thomas Hamilton's splendid Royal High School was begun in 1825 modelled on the Temple of Theseus in Athens. Carved from the Calton Hill, ►



■ St Andrew Square was the first section of the New Town to be completed and some of the top people in the Scotland made it their address.

▶ many famous names received their schooling there Sir Walter Scott, Alexander Graham Bell, three British Lord Chancellors, and even King Edward VII for a time

Edinburgh's flirtation with ancient Greece was reflected above the High School in the monument to Dugald Stewart, Professor of Moral Philosophy at the University and, below, on Regent Road, in the circular Corinthian temple to Robert Burns.

The Calton Hill had always been a special location in the Edinburgh landscape and the fitting site for the National Memorial to honour the dead in the Napoleonic Wars. It was to be an exact replica of the Parthenon, but the money ran out after only 12 columns had been erected – and that is why Edinburgh has such an eye-catching ruined Greek temple in the centre of the city

The New Town, of course, was built as a residential overspill, with the shops coming later. Around 1820, the Princes Street residents between Hanover and Hope streets hired landscape artist James Skene to design an informal countryside garden on their eight-acre portion of the valley. They called themselves the Princes Street Proprietors and their West Princes Street Gardens were for their private eyes only

At the marshy east end, which had been bought by the old Town Corporation in 1716, an enterprising market gardener successfully planted a nursery, flower beds, bushes, created footpaths and for 10s 6d a year provided 'persons of respectability' with a private key. The arrival of the railway from the south gave the Corporation the opportunity to throw open East Princes Street Gardens – and it became lauded as one of the first genuine public parks in Britain

It put pressure on the Princes Street Proprietors to follow suit, which they resisted fiercely. But the tide of public opinion was turning against them. Public parks in the latter half of the 19th

century were considered vital to offset urban squalor, and when the Scottish Society for Suppressing Drunkenness applied for access in 1851, to help keep Edinburgh folk out of the 'dram shops' on Christmas and New Year's Day, the Proprietors' resistance was cracking

The coming of the railways added further impetus. From the south the line ended at Waverley, from the west at the opposite end of Princes Street. Only the valley between prevented an east-west link. The Proprietors hired leading architect William Playfair to find ways to hide the

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The beautification of Princes Street Gardens with statues, the fountain, the Ross Bandstand seats and flower beds did not take place until the second half of the 19th century. Even the building of the extraordinary Scott Monument was not completed until 1864, more than 30 years after the writer's death. But the success of Princes Street Gardens has been an inspiration to the city

Combined with the legacy of the Victorians and the involvement of the Royal Botanic Gardens, Edinburgh has become one of the most environmentally friendly cities in the world, with almost 100 parks and major open spaces within its boundaries. One of the Capital's boasts today is

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BANK OF HERITAGE

Scotland's treasure-house of seven million books

■ The National Library of Scotland (below) is situated on George IV Bridge, Edinburgh. The Library's first edition of the Encyclopaedia Britannica (right) was published in 1771.



Scotland's history is all around us. The castles and stately homes we see on our travels are clear reminders of our past. Standing stones and ruined cottages bear witness to a very different world from our own. But an even greater insight into our heritage comes from a much less obvious source – it is the National Library of Scotland, with its rather anonymous facade on Edinburgh's George IV Bridge.

For the National Library of Scotland is the nation's 'memory bank'. It has the world's largest collection of written material relating to Scotland and the Scots, and its treasures include many of the landmark documents that have helped shape our national identity. This summer the public are being given a unique opportunity to see some of these great treasures through Scotland's Pages, an exhibition designed to celebrate Scotland's entry into the 21st century.

The Library's own history can be traced back to the 1680s, when its precursor, the Library of the Faculty of Advocates, was founded. Today, three centuries after its collections first began to be built, it houses seven million printed books, 120,000 volumes of manuscripts, 1.6 million maps, and over 20,000 newspaper and magazine titles. And, like the Advocates' Library before it, it is a 'legal deposit' library – one of only five in the UK – which means that it can claim a free deposit of new UK and Irish publications.

With such vast collections to draw on, enough to fill a multitude of exhibitions, choosing what to display in Scotland's Pages was an almost impossible task. But the Library's curators have done a remarkable job, singling out significant works from the earliest times to the present day.

The oldest document, the Kelso Charter of

1159, contains the earliest surviving image not just of one Scottish king, but of two (Malcolm IV and David I). The beautifully illuminated Iona Psalter, a marvel of craftsmanship, is almost as old, and is believed to have been created between 1180 and 1220 for Beatrix, the first Prioress of Iona and daughter of Somerled, the Lord of the Isles.

Anyone who has seen the film 'Braveheart' will be fascinated by another exhibit: the only surviving contemporary manuscript (written in 1488) of Blind Harry's epic poem 'The Wallace'. It was this poem that created the Wallace legend that found its latest expression in the Hollywood film.

One of the most moving exhibits is the letter written by Mary, Queen of Scots, in 1587, just six hours before she faced execution. Other famous historical and literary figures are also well represented, including Burns, Scott, Stevenson, David Hume, and Adam Smith.

But not all exhibits concern well-known figures. Walter Chepman and Andrew Myllar are hardly household names, but it was they who brought the printing revolution to Scotland.

On show is their slim pamphlet of poetry dated April 4, 1508, the earliest Scottish book. The first Scottish book on gardening, John Reid's 'The Scots Gard'ner' of 1683, also appears, as does the first edition of the 'Encyclopaedia

Britannica', produced in Edinburgh in 1771.

Perhaps surprisingly, it was modern exhibits that gave curators the greatest challenge. Will Alasdair Gray's 'Lanark' or Irvine Welsh's 'Trainspotting' be among the handful of icons chosen to represent the 20th century by librarians 300 years from now?

Who knows? So the exhibition ends with an invitation to the public to name what they think future generations will view as the 'treasures' or 'trash' of the 20th century.

The exhibition features an audio programme allowing visitors to experience the sounds of some of the older Scots and Gaelic documents. There is also an excellent companion to the exhibition, 'Reportage Scotland', by Louise Yeoman, published for the Library by Luath Press, and already in the best seller lists.

■ Scotland's Pages is sponsored by Semple Fraser WS. It runs at the National Library of Scotland, George IV Bridge, Edinburgh, until 29 October (Mon-Sat: 10.00 to 17.00; Sun: 14.00 to 17.00, admission free).

■ 'Reportage Scotland' (Luath Press) is available from all good bookshops, price £9.99, or direct from the Library (0131-226 4531 ext 2204). For more information about the Library and its services, visit its website at www.nls.uk or e-mail enquiries@nls.uk. ●

ART PRESENTATION FIT FOR A NATION

After 150 years Scotland's art treasure chest goes from strength to strength with acquisitions of world significance



Botticelli's 'The Virgin adoring the sleeping Christ Child' (1500) was acquired in 1999 for a price of £10.25 million.

On August 30, 1850, the cream of Scottish society gathered in Edinburgh, on the earthen Mound above the Edinburgh-Glasgow Railway Tunnel, to witness the laying of the foundation stone of the National Gallery of Scotland by Prince Albert. It was a day of national celebration and heaven-sent perfect weather.

Today, 150 years later, the National Galleries of Scotland comprise four galleries in the centre of Edinburgh: the National Gallery of Scotland at the Mound, the Scottish National Portrait Gallery in Queen Street; the Scottish National Gallery of Modern Art and the Dean Gallery, housing the Paolozzi Collection, both in Belford Road.

The National Galleries also have outstations at Duff House, Banff, and at Paxton House, Berwickshire. Each housing magnificent art collections, they share a common aim: to exhibit, acquire and conserve the finest and most significant works of art for the enjoyment and benefit of the public.

Anniversary celebrations include a gala picnic in the grounds of the Gallery of Modern Art, with catering and a host of entertainers. This fun-for all the family event takes place on the afternoon of Saturday, August 12, from 12-4pm.

A very special celebration took place on Thursday, June 8, this year, when the galleries' newly restored Botticelli, 'The Virgin Adoring the Sleeping Christ Child', was unveiled. This masterpiece was acquired for the nation in just 18 days in November last year, by the National Galleries of Scotland, for a net price of £10.25m.

Designed by William Henry Playfair (1790-1857), the National Gallery of Scotland stands opposite its earlier Playfair counterpart at the Royal Institution (now the Royal Scottish Academy).

The new National Gallery building is equally shared with the Royal Scottish Academy, which occupies the eastern side of the two main suites of octagonal rooms. The restoration of the new gallery

was devised by David Ramsay Hay, comprising claret painted walls with green 'Dutch weave' flooring - a colour scheme re-instated in the 1980s.

The Gallery has always benefited from outstanding donations of works of art. As the inaugural catalogue of 1859 stated: "The maintenance and extension of this National Collection must always, in a great measure, depend on the public spirit and liberality of individuals, there being no fixed revenue or public funds devoted to the purchase of pictures."

This 'public spirit and liberality' resulted in many bequests over the last 150 years, including masterpieces such as Frans Hals' 'Verdonck', Rembrandt's 'A Woman in Bed' and the 21 superb works by Impressionist and Post Impressionist artists from the 1960 gift and 1965 bequest of Sir Alexander Maitland.

Further opportunities for acquisitions were given by the Cowan Smith Bequest of 1919, which provided a fund of £55,000, producing an income which quadrupled the Gallery's annual purchase grant - which had itself only been created in 1903.

Amongst the most notable purchases made in subsequent years were those of Gauguin's 'The Vision after the Sermon' (1888) and Degas' 'Diego Martelli' (1932).

Velazquez's 'An Old Woman Cooking Eggs' was acquired for £57,000 from the book collection in 1955 - the Gallery's most expensive purchase at that time.

The collection was later held in a building by Canova's sculpture. The collection was based on a gross value of £7 million.

The Gallery has acquired many works by Scottish artists and it takes on increasingly its role as the national gallery of the Scottish school. Acquisitions in the last 10 years or so have included major pictures by Ramsay, Wilkie, Nasmyth and Dyce.

The Gallery's display has also been enriched by generous loans made to the collection over the years. One of the most important early Netherlandish paintings in the country, Hugo van der Goes' 'The

Trinity Altarpiece, has been on loan from the Royal Collection since 1931, while the pictures from the collection of the Duke of Sutherland have been lent since 1945-6.

The Scottish National Portrait Gallery, as its name implies, houses Scotland's collection of national portraits. It is a huge collection, numbering tens of thousands of images.

It originated in the 18th century with David, 11th Earl of Buchan, who started assembling portraits for a Temple of Caledonian Fame. Much of Buchan's collection survives and forms the foundation collection of the Gallery.

In the main hall, William Hole's pageant frieze provides the visitor with a convenient aide-memoire to Scottish history.

Above, also by Hole, are murals depicting battles for Scottish independence and events from Scotland's early history.

Entry into the portrait collection is reserved to those said to have made a distinctive contribution to Scottish life. Generally, that contribution is a positive one, but there are a few whose dishonourable behaviour has earned them their place, including the infamous Burke and Hare and the disreputable Lord Lovat – the latter in a memorable portrait by Hogarth.

The Scottish National Gallery of Modern Art has a total collection of some 5,000 items. It opened in August, 1960, at Inverleith House in Edinburgh and its collection spans the period from about 1890 to the present-day, beginning with Vuillard, Bonnard and Matisse, and British artists such as Sickert, Orpen and William Nicholson.

The Gallery's collection of Scottish art is broad and representative. Bequests have included works by Joan Eardley, Robin Philipson, William Gillies, John Maxwell and Alan Davie.

Perhaps the finest acquisition of the early 1980s was Lichtenstein's 'In the Car', bought in 1980, amid much controversy, for £100,000.

In 1984, the Gallery moved into the former John Watson's school, an imposing neo-classical building designed by William Burn in 1825.

Lying to the west of the city centre, the building provided around four times as much exhibition space as Inverleith House, room for more staff, conservation workshops, a print room, cafe and shop.

The Gallery could also now take or organise loan exhibitions on a regular basis, and the extensive

grounds have proved ideal for the siting of large sculptures.

The most outstanding acquisitions of recent years have come from Sir Roland Penrose (1900-84) and Mrs Gabrielle Keiller (1908-95). Penrose owned probably the greatest private collection of 20th century art assembled in Britain.

He acquired most of his works in the 1930s, when he established friendships with many of the French Surrealists and Picasso, whose biography he wrote.

An early Lottery grant of £3 million, awarded in 1995, enabled the purchase of a collection of 26 paintings and drawings from the Penrose collection, including works by Dali, Delvaux, Ernst, Man Ray, Magritte and Picasso.

Later that year, the Gallery received the most important gift in its history, the Dada and Surrealist collection of Gabrielle Keiller.

The Gallery has recently almost doubled in size with the opening of the Dean Gallery, across the road, in 1999.

Designed by Thomas Hamilton in 1831, the building was offered in 1994 by Lothian Region to house a generous gift by the Edinburgh-born sculptor, Eduardo Paolozzi, of a large collection of his work.

Along with the Paolozzi gift, the Dean displays the Dada and Surrealist collections, now among the world's greatest.

The National Galleries also has two magnificent outstations, at Paxton House near Berwick-upon-Tweed and Duff House in Banff. ●



■ Flying high: the flags are out as the Scottish National Gallery celebrates its 150th anniversary.



■ Among the many masterpieces on display in the summer of 2000 is Salvador Dalí's 'Apparition of Face and Fruit Dish on a Beach'.

**NATIONAL GALLERY OF SCOTLAND,
The Mound, Edinburgh EH2 2EL**

**SCOTTISH NATIONAL PORTRAIT GALLERY,
1 Queen Street, Edinburgh EH2 1JD**

**SCOTTISH NATIONAL GALLERY OF MODERN ART,
Belford Road, Edinburgh, EH4 3DR**

**DEAN GALLERY,
Belford Road, Edinburgh, EH4 3DS**

Opening hours:

Monday-Saturday 10am-5pm. Sunday 12 noon-5pm.

Extended festival opening hours (30 July-3 September):

The National Gallery and the Portrait Gallery remain open until 6pm every evening; all four Galleries open at 11am on Sunday mornings.

For details, phone: 0131 624 6200.

■ In the heart of Glasgow: a spur from the Forth and Clyde canal terminates at Port Dundas.



Waterways that kept Scotland moving



Messing about on our Lowland canals may be a pleasure for the future, but these water highways still stand as a testimony to the iron men who created them, says biker historian David Ross

The Forth and Clyde canal, which runs from Grangemouth in the east to Bowling in the west, was begun in 1768. One fact that has always intrigued me was that the Battle of Falkirk, the field of which is not too far from the canal, had been fought between the Jacobites and Hanoverians only 22 years before – in 1746.

It seems strange that at the time of the industrial revolution, great works of engineering were taking place so close to the days of battles with targe and claymore in central Scotland.

The Forth and Clyde was finished in 1790. When you consider that all its construction, all its dykes, all the digging, all the rivers and streams to be crossed, had to be done by hand, it becomes all the more impressive. No JCBs in those days – the workmen used nothing more than wheelbarrows and spades to create their lasting memorial.

I've always intended to walk the canal end to end, and I'll do it in the near future. It is 35 miles long but, as you can imagine, there is little gradient, and the towpaths are in a tolerable state.

The canal does reach 156ft above sea level near Castlecary, achieved by the passage of various locks. It is on average 56ft wide on its surface,

27ft wide at the bottom, and is roughly 10ft deep over its entire course.

It closely follows the Roman Antonine Wall along almost its entire length, which shows how even our earliest visitors were wise to this easily-navigable route over the narrow waist of our land.

The canal sends off a spur into the very heart of Glasgow, terminating 2.75 miles later at the city's Port Dundas. The old warehouses here are now converted into flats, and if you are in Glasgow and have a spare hour or two, you can do worse than park at the basin, and go for a stroll along the banks. It is astonishing the amount of wildfowl nesting along the route.

The Union Canal was opened in 1822, after only four years of work. It runs between Port Hopetoun, at the west of Edinburgh, to join with the Forth and Clyde a mile-and-a-half south-west of Falkirk.

It covers 31.5 miles during its course. This made it feasible to take passengers and goods by canal, all the way from Glasgow to Edinburgh, albeit via Falkirk.

The Union Canal boasts a tunnel, 700 yards in length, taking it through a hill south of Falkirk.

I once met a man in passing, who told me he worked on the upkeep of the Union canal. I asked him a

couple of questions, and I still vividly recall his answers.

Were any items of interest found when they were checking the canal bed, I asked.

"Whisky bottles", came the reply. "Thousands and thousands of them."

It seems the barges, with little else to do other than steer a horse-drawn barge, liked their whisky – and the empties were simply slung overboard.

My other question was what happens when it rains really heavily on only one end of the canal?

He told me it takes three days for the canal, through its own devices, to level out. Of course, there is no current flow, but the canal does have ducts to run off excess water to prevent overflow.

At this time, work is under way to raise the level of the M8 over the Union Canal, and the A80 over the Forth and Clyde, to make them navigable again.

Earlier planners simply ran the roads too close to the surface leaving insufficient clearance for traffic.

It is good these inland waterways will once again be put to use – even if only for pleasure craft.

It is a fitting testimony at least to the men who strained muscles working thousands of man-hours in their construction. ●

Scotland's Story

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The Vale of Dedham, painted in 1828 by John Constable (1776-1837)

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